

INTERNATIONAL SEARCH REPORT

International application No.

PCT/AU02/01281

A. CLASSIFICATION OF SUBJECT MATTERInt. Cl. ⁷: C12Q 1/68, 1:46

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

SEE ELECTRONIC DATABASE

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SEE ELECTRONIC DATABASE

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPIDS: CA: MEDLINE. KEYWORDS: Streptococcus, Streptococcus agalactiae, cps, capsular polysaccharide, capsular antigen, sero?, rib, alp2, alp3, surface antigen, surface protein, mobile genetic element, transposon.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	Kong et al. "Serotype Identification of Group B Streptococci by PCR and Sequencing" Journal of Clinical Microbiology (2002) Vol 40 (1): pages 216-226 (see the whole document)	1-12, 23-28 31-35
P, X	Kong et al. "Molecular Profiles of Group B Streptococcal Surface protein Antigen Genes: Relationship to Molecular Serotypes" Journal of Clinical Microbiology (2002) Vol 40 (2): pages 620-626 (see the whole document)	13-17, 29-35
X	Lachenauer et al. "Mosaicism in the Alpha-Like Protein Genes of Group B Streptococci" Proc Natl Acad Sci USA. (2000) Vol 97 (17): pages 9630-9635 (see the whole document) EMBL DATABASE AF208158, ACCESSION NUMBER AF208158 23 August 2000	13-16, 29



Further documents are listed in the continuation of Box C



See patent family annex

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search
28 November 2002

Date of mailing of the international search report

09 DEC 2002

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Tamura et al. "Analysis of Restriction Fragment Length Polymorphisms of the Insertion Sequence IS1381 in Group B Streptococci" The Journal of Infectious Diseases (2000) Vol 181: pages 364-368 (see the whole document)	18-20
X	Yamamoto S et al. "Molecular characterization of type-specific capsular polysaccharide biosynthesis genes of Streptococcus agalactiae type Ia Journal of Bacteriology (1999) Vol 181: pages: 5176-5184 EMBL DATABASE ENTRY AB028896.2, ACCESSION NUMBER AB028896 16 July 1999	23
X	Miyake K et al. "CpsJ of Streptococcus agalactiae type Ib shows beta-1,3-galactosyltransferase activity" Unpublished. EMBL DATABASE ENTRY AB050723.1, ACCESSION NUMBER AB050723 5 February 2001	27

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Box I Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos :
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos :
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos :
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a)

Box II Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

Invention I: Claims 1 to 12, 23 to 28 completely and claims 17, 22, and 31 to 35 partially.

Invention II: Claims 13 to 16, 29 and 30 completely and claims 17, 22, and 31 to 35 partially.

Invention III: Claims 18 to 21 completely and claim 22 partially. (see supplemental sheet)

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims
2. ☒ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

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PCT/AU02/01281**Supplemental Box**

(To be used when the space in any of Boxes I to VIII is not sufficient)

Continuation of Box No: II

The international application does not comply with the requirements of unity of invention because it does not relate to one invention or to a group of inventions so linked as to form a single general inventive concept. In coming to this conclusion the International Searching Authority has found that there are different inventions as follows:

Invention I relates to primers, compositions and methods for typing group B streptococcus based on sequence analysis of capsular proteins *cpsD*, *cpsE*, *cpsF*, *cpsG* and/or *cpsI/M*.

Invention II relates to primers, compositions and methods for typing group B streptococcus based on determining the presence or absence of one or more of the surface protein genes, *rib*, *alp2* and *alp3*.

Invention III relates to primers and methods for typing group B streptococcus based on determining the presence or absence of one or more mobile genetic elements selected from *IS861*, *IS1548*, *IS1381*, *ISSa4* and *GBSi1*.

The technical feature common to all three inventions is considered to be methods of typing group B streptococcus using nucleic acid primers. However this feature is obvious in view of the disclosure of Lachenauer et al. which prefigures methods of typing based on mosaicism in the *alp2* and *alp3* genes in GBS strains V and VIII. Therefore methods of typing group B streptococcus can not be regarded as a unifying technical feature.